

What Is Claimed Is:

Sub 17 1. A method for monitoring a parameter of a tire for a vehicle having a plurality of conductive components which form an electromagnetic path with first and second ends, the method comprising the steps of:

5 generating a signal indicative of a parameter of the tire using a sensor disposed within the tire;

transmitting the generated signal along the electromagnetic path by introducing the generated signal

10 to the electromagnetic path first end;

receiving a path signal at the electromagnetic path second end, the path signal being responsive to the generated signal; and

15 monitoring the tire parameter by monitoring the path signal.

Sub 17 2. The method of claim 1 wherein the step of generating a signal is performed at periodic intervals separated by an interval in which no signal is generated.

3. The method of claim 1 wherein the step of monitoring includes the step of comparing the tire parameter to a selected threshold.

20

Sub 27 4. The method of claim 1 further comprising the step of indicating the status of the monitored tire pressure.

5. The method of claim 1 wherein the tire parameter is the pressure within the tire.

25

6. The method of claim 1 wherein the tire parameter is the temperature within the tire.

7. A system for monitoring a parameter of a tire for a vehicle, the system comprising:

5 a sensor, disposed within the tire, for generating a signal indicative of the parameter of the tire;

an electromagnetic path being formed of a plurality of conductive components of the vehicle, the
10 electromagnetic path having first and second ends;

a transmitter, in electrical communication with the sensor and with the electromagnetic path first end, for transmitting the generated signal along the electromagnetic path;

15 a receiver, in electrical communication with the electromagnetic path second end, for receiving a path signal at the electromagnetic path second end, the path signal being responsive to the generating signal; and

20 a monitor, in electrical communication with the receiver, for monitoring the tire parameter by monitoring the path signal.

8. The system of claim 7 wherein the tire parameter is the pressure within the tire.

25 9. The system of claim 8 wherein the sensor comprises a first conductive plate which flexes in response to tire pressure and a second conductive plate which is stationary with respect to the first conductive plate such that the capacitance between the two plates
30 is a function of the tire pressure.

~~10. The system of claim 7 wherein the tire parameter is the temperature within the tire.~~

11. The system of claim 7 wherein the electromagnetic path comprises:

- 5 a wheel rim for the tire;
one or more wheel bearings for rotatably supporting the wheel on a non-rotating member; and
the non-rotating member.

Subc 47
10 ~~12. The system of claim 7 wherein the monitored tire is a tire mounted to support the weight of the vehicle.~~

13. The system of claim 7 wherein the monitored tire is a spare tire.

Subc 57
15 ~~14. The system of claim 7 further comprises means for activating the sensor wherein the signal is generated only at periodic intervals separated by a interval in which no signal is generated.~~

20 15. The system of claim 7 wherein the monitor includes means for comparing the tire parameter to a selected threshold.

Sub B37
16. The method of claim 7 further comprising indicator means in electrical communication with the monitor for indicating the status of the monitored tire parameter.

25 17. A system for monitoring a parameter of a tire for a vehicle, the system comprising:

a sensor, disposed within the tire, for generating a signal indicative of the pressure of the tire;

5 an electromagnetic path being formed of a plurality of conductive components of the vehicle including a wheel rim for the tire, one or more wheel bearings for rotatably supporting the wheel on a non-rotating member, and the non-rotating member, the electromagnetic path having first and second ends;

10 a transmitter, in electrical communication with the sensor and with the electromagnetic path first end, for transmitting the generated signal along the electromagnetic path;

15 a receiver, in electrical communication with the electromagnetic path second end, for receiving a path signal at the electromagnetic path second end, the path signal being responsive to the generating signal; and

20 a monitor, in electrical communication with the receiver, for monitoring the tire parameter by monitoring the path signal.

Sub 18. The system of claim 17 wherein the tire parameter is the pressure within the tire.

25 19. The system of claim 18 wherein the sensor comprises a first conductive plate which flexes in response to tire pressure and a second conductive plate which is stationary with respect to the first conductive plate such that the capacitance between the two plates is a function of the tire pressure.

30 20. The system of claim 17 wherein the tire parameter is the temperature within the tire.

21. The system of claim 17 further comprises means for activating the sensor wherein the signal generated only at periodic intervals separated by a interval in which no signal is generated.

5 *Sub B 47* 22. The method of claim 17 wherein the monitor includes means for comparing the tire pressure to a selected threshold.

10 23. The method of claim 17 further comprising indicator means in electrical communication with the monitor for indicating the status of the monitored tire pressure.

24. A system for monitoring a status of a parameter of a tire for a vehicle, the system comprising:

15 a sensor, disposed within the tire, for generating a signal indicative of the parameter of the tire;

20 a processor, in electrical communication with the sensor for determining the status of the tire parameter by comparing the tire parameter to a selected threshold;

25 a transmitter, in electrical communication with the processor for transmitting a status signal indicative of the tire parameter status along a first communications link;

a monitor, in communication with the first communications link, for monitoring the status of the tire parameter;

a communication unit in electrical communication with the processor having a first receiver for receiving a processor control command; and

5 a remote controller, positionable for electrical communication with the communication unit along a second communications link, for initiating the processor control command.

10 25. The system of claim 24 wherein the communication unit further includes a second transmitter for sending a transmission in response to the processor control command.

15 26. The system of claim 25 wherein the remote controller further comprises a second receiver for receiving the transmission sent by the second transmitter.

27. The system of claim 24 wherein the processor control command includes a command to change the selected threshold.

20 28. The system of claim 26 wherein the processor control command includes a command to transmit a controller parameter.

29. The system of claim 28 wherein the controller parameter includes a tire identification.

25 30. The system of claim 28 wherein the controller parameter includes a controller identification.

31. The system of claim 26 wherein the processor control command includes a command to test the sensor and to transmit a test result.

5 32. The system of claim 24 wherein the second communications link comprises an inductively coupled channel.

33. The system of claim 24 wherein the tire parameter is the pressure within the tire.

10 34. The system of claim 24 wherein the tire parameter is the temperature within the tire.

35. A system for monitoring a parameter of a tire for a vehicle, the system comprising:

15 a sensor, disposed within the tire, for generating a signal indicative of the parameter of the tire;

a transmitter, in electrical communication with the sensor for transmitting the generated signal along a first communications link;

20 a monitor, in communication with the first communications link, for monitoring the tire parameter by receiving the generated signal;

a processor, in electrical communication with the monitor for determining an alarm condition based upon the monitored tire parameter;

25 a communication unit in electrical communication with the processor having a first receiver for receiving a processor control command; and

a remote controller, positionable for electrical communication with the communication unit

along a second communications link, for initiating the processor control command.

36. A system for monitoring a parameter of an inflatable tire for a vehicle, the system comprising:

5 a sensor, disposed within the tire, for generating a signal indicative of the parameter of the tire;

a transmitter, in electrical communication with the sensor for transmitting the generated signal
10 along a first communications link;

a piezo-electric element, for supplying power to the transmitter independent of the inflation pressure of the tire; and

a monitor, in communication with the first
15 communications link, for monitoring the tire parameter by receiving the generated signal.

37. A system for monitoring a temperature of a tire for a vehicle, the system comprising:

a first temperature sensor, disposed within
20 the tire, for generating a signal indicative of the temperature of the tire;

a transmitter, in electrical communication with the sensor for transmitting the tire temperature signal along a first communications link;

25 a second temperature sensor, associated with the vehicle, for generating a signal indicative of the ambient temperature of the air surrounding the vehicle; and

5 a monitor, in communication with the first communications link and the second temperature sensor, for determining a temperature parameter in dependence upon the tire temperature signal and the ambient temperature signal.

10 38. A method for providing a user interface for a tire parameter monitoring system for a plurality of tires of a vehicle, the monitoring system having a alarm state triggerable by a parameter fault in any one of the tires, the method comprising the steps of:

displaying, in alphanumeric format, an indication of the occurrence of an alarm state which identifies a particular tire which is the source of the alarm state;

15 receiving a first indication from the user to terminate the alarm condition;

terminating the alarm display in response to the receipt of the first user indication;

20 receiving a second indication from the user to provide further information on the source tire; and

displaying, in alphanumeric format, the tire parameter corresponding to the source tire in response to the receipt of the second user indication.
